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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/563,233

06/09/2006

Thomas McQuiggin Lowes

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24240 7590 03/15/2011

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EXAMINER

WILSON, GREGORY A

ART UNIT

PAPER NUMBER

3749

MAIL DATE

DELIVERY MODE

03/15/2011

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/563,233	LOWES, THOMAS MCQUIGGIN	
	<b>Examiner</b>	<b>Art Unit</b>	
	Gregory A. Wilson	3749	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 September 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,9-14,16,21-37,42-45 and 51-61 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23-26 is/are allowed.
- 6) ☒ Claim(s) 1,2,4,9-14,16,21,22,27-37,42-45 and 51-61 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1, 2, 4, 9-14, 16, 21, 22, 27-37, 42-45 and 51-61** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hansen et al (6,672,865) in view of Dunne et al (6,440,356)**. **Hansen et al** a kiln system (10) for mixing process gas flow that flows through housing (12) of an exhaust gas bypass system (SEE Figures 1-4) including a precalciner and riser duct, wherein the kiln system is for preparing cement clinker (SEE Summary of Invention) and has a gas temperature between 850-1400 degrees Celsius (SEE column 13, lines 27-38) and includes a plurality of injectors (32) arranged at angles of between 0 to 60 degrees at predetermined intervals around the cross section of the interior of the housing (SEE Figure 6) and are connected to a gas supply system (34) which includes a fan, blower or compressor which is operable to feed pressurized air (or preheated) of high energy/velocity (a jet), to the injectors to produce rotational momentum in the kiln gas stream to dissipate stratification (column 9, lines 23-35) such that kiln gas is entrained in the injected gas along the axis of the housing, a combination of the position of the injectors within the kiln system and the nozzles (36) aid in imparting the rotational momentum (swirling) (Figure 7 illustrates the inherent gas flow out of the nozzles as affected by the flattened fronts shown in Figures

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8a & 8b **as it enters the housing of the kiln system**) and as can be seen in the Figures 8a & 8b have angles which anticipate the applicants claim 4 and the injectors are capable of impinging tangentially on an imaginary circle which forms towards the center of the housing as suggested by the flow shown in Figure 6 of high pressure air exiting the nozzles (36). Based off the illustration of Figure 6, a person having ordinary skill in the art would recognize and conclude that at least 10 percent of the cross sectional area of the housing is covered by the circle of air flow, additionally the claims directed to the velocity of the injection gas as measured in Reynolds Number or the frequency of turbulence or the calculation in which these values are determined are not novel limitations which cannot be performed by the structure of Hansen et al. As previously mentioned, Hansen et al includes nozzles (36) which are configured to impart some rotational momentum to the gas that flows through the nozzle conduit, (SEE Figures 8a & 8b shows end portions with slots which inherently functioning as vanes (ie swirling means) or bluff bodies since they consist of a flattened front), however Hansen et al does not particularly disclose swirl vanes positioned within the injector thus providing axial swirl along the axis of the injector. Dunne et al teaches that it is known in the art for the use of a gas injector (31) to include swirl vanes (39) located inside the injector for imparting a strong rotational or swirling motion to a hot gas blast emerging from the injector. A person having ordinary skill in the art at the time the invention was made would have found it obvious to have modified the injectors of Hansen et al by substituting the injectors as taught by Dunne et al which includes swirl vanes for the purpose of imparting a strong rotational or swirling motion for the purpose of achieving

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the turbulent flow characteristics so that process gas can be entrained by the injected gas.

***Allowable Subject Matter***

**Claims 23-26** are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory A. Wilson whose telephone number is (571)272-4882. The examiner can normally be reached on 7 am - 4:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve McAllister can be reached on (571) 272-6785. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gregory A. Wilson/  
Primary Examiner, Art Unit 3749  
March 10, 2011

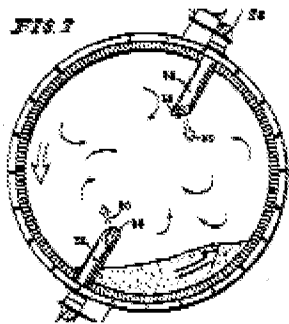
### ***Response to Arguments***

With regards to the applicants argument of the use of the term "sufficiently" as used in the claim, namely that the momentum is sufficiently high to produce a jets having appropriate turbulent flow characteristics such that the process gas flow is entrained by said injected flow, the examiner agrees with the applicants argument and recognizes that the term was indeed supported in paragraph [0049] of the applicants specification which defines which defines the total momentum of the injection gas during injection is approximately 50 to 150% of the momentum of the process gas flow. The 35 U.S.C. 112 rejection to claims 1-4, 9-16, 21-38, 42, 43, and 57-61 are hereby withdrawn.

Applicant's arguments filed 10/28/09 with regard to the prior art reference of Hansen et al (6,672,865) have been fully considered but they are not persuasive. The applicant argues that in independent claims 1, 23, 37 and 44, the claims define that the

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injected gas is caused to swirl about its axis of injection as it enters the housing of the kiln system, citing paragraphs [0109]-[0111]. The applicant argues that Hansen fails to disclose the swirl means of the axial swirling feature set forth in the four independent claims stated above and that the examiner's finding on this feature is not understandable, further stating Hansen discloses no axial swirl in the injected gas and discloses no means capable of imparting an axial swirl; The examiner respectfully disagrees and directs the applicants attention to Figure 7 which shows the high energy



injected air (50) injected to impart rotational momentum to the kiln gas stream (SEE column 9, lines 30-35), a person having ordinary skill in the art would recognize that the rectangular cross-section of the orifices shown in Figures 8a & 8b having an aspect ratio greater than one, would impart an even greater rotational momentum to the kiln gas stream some of which will inherently be in the axial direction as evidenced by the unnumbered flow arrows in Figure 7. The examiner maintains the position that as the flow enters the kiln system via the air injection tubes (32), the flow is caused to impart a swirl as it is forced through the openings as shown in Figures 8a & 8b (SEE that Figures 8a & 8b show different angles which will affect the direction of flow which will be more dramatic than the flow shown as element 50 in Figure 7, which even in this Figure there is shown some resultant axial flow that can be

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produced when the injected air interacts the process gas in the kiln) and thus the claims as interpreted by the examiner do not distinguish over the prior art reference of Hansen et al. With regards to the applicants argument that the flow through the orifices (38) of Hansen et al as indicated by the flow arrows, show the direction of the air in the overall process gas flow *after the injected gas has left the nozzle 36, and do not show axial swirl imparted to gas traveling through the injectors as it enters the housing*, the examiner respectfully disagrees and again directs applicants attention to Figures 8a & 8b which have ends on the orifices (38) which affect the flow of injected air as it is entering the housing, ie: the injected air is not inside the kiln housing until **after** it has passed through the orifice ends shown in Figures 8a & 8b.

Applicant's arguments, with respect to the 35 U.S.C. 102(b) rejection of Quittkat have been fully considered and are persuasive. The rejection of claims 1-4, 9, 27-30, 44, 45, 47, 57, 58, 60 and 61 have been withdrawn. Quittkat includes a swirling means (32, 33), however this swirling means is not provided in the injectors but are installed in the main wall of the furnace housing and thus affects the flow of gas already present in the housing.